Contribution ID: **11** Type: **Long Talk (20 mins)**

Scattering amplitudes and electromagnetic horizons

We consider the scattering of charged particles on particular electromagnetic fields which have properties analogous to gravitational horizons. Classically, particles become causally excluded from regions of spacetime beyond a null surface which we identify as the 'electromagnetic horizon'. In the quantum theory there is pair production at the horizon via the Schwinger effect, but only one particle from the pair escapes the field. Furthermore, unitarity appears to be violated when crossing the horizon, suggesting there is no well-defined S-matrix. Despite this, we show how to use the perturbiner method to construct 'amplitudes'which contain all the dynamical information required to construct observables related to pair creation, and to radiation from particles scattering on the background.

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